Accommodations Toolkit

Noise Reduction: Research

This fact sheet on **noise reduction** is part of the *Accommodations Toolkit* published by the National Center on Educational Outcomes (NCEO). It summarizes information and research findings on use of noise reduction as an accommodation. This toolkit also contains a summary of states' accessibility policies for noise reduction (/nceo/accommodations-toolkit/noise-reduction-policies).

What is noise reduction? Noise reduction is an accommodation that minimizes auditory distractions by reducing noise in the testing environment (Batho et al., 2020; Ganguly, 2010; Smith, 2010; Smith & Riccomini, 2013). To reduce noise, a student may use noise-reducing headphones or buffers to minimize audible noise while completing an assessment (Ganguly, 2012; Smith, 2010; Smith & Riccomini, 2013).

What are the research findings on who should use this accommodation? Noise reduction may be beneficial for many students with disabilities, including some students with learning disabilities and attentions-deficit/hyperactivity disorder (ADHD). Both elementary and secondary students may benefit from using this accommodation (Batho et al., 2020; Smith, 2010; Smith & Riccomini, 2013).

What are the research findings on the implementation of noise reduction? Four studies were located on the implementation of noise reduction as an accommodation.

Three of these studies examined the effect of noise reduction on student performance. Findings were mixed, though noise reduction was generally beneficial.

- Batho and colleagues (2020) compared no noise, classroom noise, and white noise conditions on secondary students with ADHD. White noise improved reading and writing speed, though not accuracy. In contrast, the no noise condition improved writing accuracy and reading comprehension, whereas the effects of classroom noise on student performance were not evident.
- Two comparative studies on noise reduction of students in general education classrooms found that when students wore noise-reducing headphones there was greater improvement in reading scores for elementary students with disabilities as compared to students without disabilities (Smith, 2010; Smith & Riccomini, 2013).

One study examined how frequently noise reduction was used as compared to other accommodations.

- Ganguly (2010) implemented different accommodations on state assessments with elementary and middle school students with emotional or behavioral disorders (EBD). All students received a combination of two or more accommodations with noise buffer the least frequently used test accommodation.

What perceptions do students and teachers have about noise reduction? Two studies examined student and teacher perceptions of noise reduction:

- Smith (2010) reported most students found headphones helpful to reduce noise to minimize distractions.
- Students in the Batho et al. (2020) study perceived it less challenging to complete assessments under a "no noise" condition than under classroom noise or white noise test-taking conditions.

What have we learned overall? There is some evidence noise reduction is a useful testing accommodation, though only a few studies have analyzed the use of this accommodation. There is a clear need for additional research on this accommodation since only four studies were found that analyzed noise reduction, and only one of these studies was published within the last five years.

Footnotes

[1]

Research on noise reduction summarized here is also available in NCEO's searchable *Accommodations for Students with Disabilities Bibliography* (https://nceo.info/Resources/bibliographies):/nceo.info/Resources/bibliographies (https://nceo.info/Resources/bibliographies)) and in NCEO syntheses of research (see summaries for: 1999-2001 (https://nceo.umn.edu/docs/OnlinePubs/TechReport34.pdf), 2002-2004 (https://nceo.umn.edu/docs/OnlinePubs/Tech45/Technical45.pdf), 2005-2006 (https://nceo.umn.edu/docs/OnlinePubs/Tech47/TechReport47.pdf), 2007-2008 (https://nceo.umn.edu/docs/OnlinePubs/Tech56/TechnicalReport56.pdf), 2009-2010 (https://nceo.umn.edu/docs/OnlinePubs/Tech65/TechnicalReport65.pdf), 2011-2012 (https://nceo.umn.edu/docs/OnlinePubs/Synthesis94/Synthesis94.pdf), 2013-2014 (https://nceo.umn.edu/docs/OnlinePubs/Report402/NCEOReport402.pdf), 2015-2016 (https://nceo.umn.edu/docs/OnlinePubs/NCEOReport412.pdf), 2017 (https://nceo.umn.edu/docs/OnlinePubs/NCEOReport418.pdf), 2018 (https://nceo.umn.edu/docs/OnlinePubs/NCEOReport423.pdf), 2019 (https://nceo.umn.edu/docs/OnlinePubs/NCEOReport433.pdf). See the reports and online bibliography for additional information about the criteria used to identify studies included in this fact sheet.

References

Batho, L. P., Martinussen, R., & Wiener, J. (2020). The effects of different types of environmental noise on academic performance and perceived task difficulty in adolescents with ADHD. *Journal of Attention Disorders*, *24*(8), 1181–1191. https://doi.org/10.1177/1087054715594421

Ganguly, R. (2010). Testing accommodations for students with emotional or behavioral disorders: A national survey of special education teachers. *Dissertation Abstracts International: Section A. Humanities and Social Sciences*, *71*(12). http://search.proquest.com/docview/787893086/abstract (http://search.proquest.com/docview/787893086/abstract)

Smith, G. W. (2010). The impact of a noise-reducing learning accommodation utilized by students with learning disabilities during an independent reading inventory. *Dissertation Abstracts International: Section A. Humanities and Social Sciences*, *71*(05). http://search.proquest.com/docview/304677061/abstract (http://search.proquest.com/docview/304677061/abstract)

Smith, G. W., & Riccomini, P. J. (2013). The effect of a noise reducing test accommodation on elementary students with learning disabilities. *Learning Disabilities Research & Practice*, *28*(2), 89–95. https://doi.org/10.1111/ldrp.12010

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